

Multiple pathways to employee engagement: A configurational analysis of DEI and psychological safety among Indian IT employees

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Abstract

This study explores how Diversity, Equity, Inclusion and Psychological Safety interact with tenure and organisation size to contribute to high Employee Engagement among Indian information technology employees. It addresses the limitation of traditional linear models that identify the average net effect of isolated predictors but may overlook alternative and asymmetric engagement pathways. The study employs a cross sectional survey of 360 Indian IT employees and fuzzy set Qualitative Comparative Analysis. Five validated perceptual constructs, namely Diversity, Equity, Inclusion, Psychological Safety and Employee Engagement, were measured using five point Likert type scales. Construct scores were transformed into fuzzy set membership scores, and tenure and organisational size were included as contextual conditions. Necessity and sufficiency analyses were used to identify the pathways to high Employee Engagement. No single condition met the 0.90 level of necessity, indicating that there is no universal condition for high Employee Engagement. The sufficiency analysis yielded nine significant configurations. Psychological Safety emerged as an overarching theme across pathways, while Equity and Inclusion also emerged as key conditions for the development of engagement. Organisation size and tenure served as contextual conditions that shaped alternative paths to engagement. The study adds to the DEI engagement literature by moving from symmetric prediction to configurational explanation, revealing that engagement among Indian IT employees is built on several bundles of fairness, belongingness, representation, psychological safety and organisational context rather than a single direct effect mechanism.

Keywords: Diversity, Equity, Inclusion, Psychological Safety, Employee Engagement, Indian IT Sector, fsQCA, Configurational Analysis

JEL Classification: M12, J24, M54

1. Introduction

Employee Engagement is a major concern for organizations operating in knowledge-intensive sectors, as engaged employees invest cognitive, emotional and behavioural energy in their work. Kahn's (1990) seminal theory associates engagement with psychological meaningfulness, safety and availability while Schaufeli et al. (2002) view engagement as vigour, dedication and absorption. Engagement is especially important in the Indian IT industry as the work is team-based, project-based and relies on collaboration across specialized professional roles. Software developers, web developers, database administrators, cybersecurity analysts and project leads do not simply do their assigned tasks. They share knowledge, raise concerns, solve technical problems and adapt quickly to changing client and technological needs. In such circumstances, engagement will likely be influenced by the way employees perceive the workplace as fair, inclusive and safe and not by job design alone. Therefore, Diversity, Equity and Inclusion (DEI) has become a major concern in human resource management and organizational behaviour. DEI is not a monolithic policy space. Diversity is the presence, acceptance and respectful treatment of employees from different demographic, educational, professional and social backgrounds. Equity means fairness in access to opportunities, rewards, developmental resources and recognitions. Inclusion means employees feel they have voice, belongingness, dignity and participation in daily organizational life (Jansen, 2014; Shore, 2011). Previous research has shown that diversity practices can improve engagement when employees perceive them to be genuine, and when diversity is accompanied by inclusion and trust (Alshaabani et al., 2022; Jerónimo et al., 2022). Equity is especially important in influencing employees' decisions to reciprocate effort and commitment, based on their assessment of the fairness of procedures, outcomes and interpersonal treatment (Colquitt, 2001). Psychological Safety is the bridge between formal DEI efforts and the lived experience of employees. Psychological safety was introduced by Edmondson as a shared belief that a work team is safe for interpersonal risk taking. Subsequent work has shown that it supports voice, learning, help-seeking and team effectiveness (Edmondson, 1999; Edmondson & Lei, 2014; Kim et al., 2020). Psychological safety matters in DEI spaces because even if employees are formally represented in the workforce, they might be reluctant to speak up if they fear embarrassment, exclusion or retaliation. More recent research connects inclusive leadership and employee voice to psychological safety, thus confirming the idea that safety transforms interpersonal respect and inclusion into active engagement (Fatoki, 2024; Vakira et al., 2023).

Studies on engagement with DEI have predominantly employed symmetric methods like regression and structural equation modelling. Such procedures are useful in that they test whether a predictor has a significant average effect on an outcome. For example, diversity management has been associated with engagement, perceived diversity practices with psychological safety and contextual performance, and inclusion with different types of employee engagement (Alshaabani et al., 2022; Dongrey & Rokade, 2021; Razzak et al., 2022). But symmetric models assume that the same factor has the same directional logic across cases. They are less appropriate when the

theoretical expectation is equifinality, when different combinations of conditions can produce the same outcome.

This constraint is very important for Indian IT employees. A highly engaged employee could work in an organization that is equitable and psychologically safe. Another may be highly engaged because the organization is diverse and inclusive, even with low tenure. A third may be engaged, because large organisations have institutionalized DEI systems that provide visibility, voice and procedural fairness. These possibilities imply that engagement is configurational. Fuzzy-set Qualitative Comparative Analysis (fsQCA) fits this logic because it identifies necessary and sufficient combinations of conditions, acknowledges equifinality and considers causality to be conjunctural and asymmetric (Fiss, 2011; Pappas & Woodside, 2021; Ragin, 2008; Woodside, 2013). Hence, the present study aims to investigate what combinations of Diversity, Equity, Inclusion, Psychological Safety, tenure and organization size are sufficient for high Employee Engagement of Indian IT employees. The paper contributes to the literature in three aspects. First, it advances DEI-engagement research by demonstrating that DEI dimensions function as bundles rather than in isolation. Secondly, it contributes to Psychological Safety research by acknowledging safety as a recurring condition in alternative engagement pathways. Third, it progresses at the methodological level by using fsQCA on Indian IT employee data in response to recent calls for configurational approaches for work engagement in digital and technology-intensive settings (Pappas & Woodside, 2021; Ye et al., 2024).

The study is also carefully situated to not be confused with traditional DEI-engagement studies. Previous work has shown DEI dimensions and Psychological Safety are important but it does not fully explain how several conditions together create engagement for different types of employees. A configurational design is useful because it views employees as cases that are in different combinations of fairness, belongingness, safety, tenure, and organizational scale. This is critical for journal contribution, because it turns the study from another mediation or regression paper to an asymmetric explanation of engagement pathways (Fiss, 2011; Pappas & Woodside, 2021). The practical problem considered in the study is no less important. IT organizations invest in diversity hiring, equal-opportunity policy, appraisal systems, employee resource groups and open-door communication channels. But employees may not feel these initiatives the same. Some employees might react more strongly to fair procedures, others might respond more to inclusion, psychological safety or visible organizational support. Such differences can be masked by a single net-effect estimate. The study identifies several pathways and therefore provides managers with a more actionable understanding of how engagement can be built through alternative but coherent combinations of DEI and safety conditions.

2. Literature Review and Proposition Development

2.1 Diversity, Equity and Inclusion as workplace experience

DEI is no longer a compliance conversation, but an employee-experience framework. Diversity and inclusion are to be understood together as, “representation is only meaningful if employees are included as valued members of the work group” (Shore et al., 2011). Jansen et al. (2014) conceptualize further inclusion as a relational state in which individuals experience belonging and authenticity. These views are especially valid for IT organizations, where employees with different educational and professional background have to coordinate their expertise in software development, cyber security, database administration and project management. Diversity does not guarantee engagement. You can have a diverse workforce but not create participation if employees feel excluded, biased or have limited voice. Alshaabani et al. (2022) found that diversity management was linked to employee engagement and that this relationship was moderated by organizational trust and job insecurity. Inclusive conditions also boost the effect of diversity practices on engagement, according to Jerónimo et al. (2022). The findings suggest that diversity is engagement-relevant when differences are seen to be respected and supported, rather than simply counted.

Equity is the fairness-oriented side of DEI. Employees evaluate the justice of organizational procedures in four ways: distributive, procedural, interpersonal, and informational (Colquitt, 2001). Equity in employee engagement means that assignments, promotions, recognition, rewards, learning opportunities and managerial support are distributed in a fair and non-biased way. If employees perceive organizational systems to be unfair, the exchange between the employee and organization becomes weakened and engagement is likely to be reduced. On the other hand, fairness can create a sense of predictability and trust that promotes employee effort and voice. Inclusion is the participative, relational dimension of DEI. It’s about how employees feel included, listened to and respected in their day-to-day interactions. Nishii (2013) showed that a climate for inclusion can benefit gender-diverse groups by reducing interpersonal bias and improving unit-level outcomes. Razzak et al. (2022) found positive associations between inclusion and intellectual, social and affective engagement and the strength of this relationship was moderated by procedural justice. Inclusion is therefore not only a welcome cultural value; it is also a condition that can activate employee energy, belongingness and participation.

2.2 Psychological Safety and engagement

Psychological safety is one of the most important constructs for explaining learning, voice and engagement in organisations. It is a shared belief that the team is safe for interpersonal risk taking, as defined by Edmondson (1999). Later, Edmondson and Lei (2014) reviewed the development of the concept and pointed to its relevance for voice, learning and cross boundary collaboration. Psychological Safety is a key to engagement as people will be more willing to put themselves into work if they can ask questions, admit mistakes, disagree constructively and seek help without fear.

The relationship between Psychological Safety and engagement is also consistent with Kahn's (1990) theory of personal engagement. One of the conditions that Kahn identifies is psychological safety, which allows employees to bring their whole selves to work. A complementary measurement perspective is provided by Schaufeli et al. (2002), who treat engagement as vigour, dedication and absorption. In this sense safety does not supplant engagement, it creates the inter-relational conditions in which engagement becomes easier. Kim et al. (2020) further show that psychological safety influences team performance through learning behaviour and efficacy, thus affirming the notion that safety allows constructive work behaviour.

Psychological Safety is especially important in the context of DEI. There may be formal diversity policies, but employees may keep quiet if they believe speaking honestly will come at an interpersonal cost. Dongrey and Rokade (2021) have observed a link between perceived diversity practices and psychological safety in relation to contextual performance in an Indian organizational context. Fatoki (2024) further suggests that inclusive leadership promotes employee voice through psychological safety and affective commitment. Likewise, Vakira et al. (2023) found that psychological safety mediates the effect of inclusive leadership on engagement. Psychological safety, the research shows, transforms workplace respect into active contribution.

2.3 Why a configurational approach is required

Most studies on DEI, Psychological Safety and engagement follow a linear logic, where one construct is an antecedent and the other an outcome. This is useful, but not enough to explain complex organizational phenomena. Fiss (2011) argues that organizational outcomes are often the result of causal condition combinations rather than individual variables. Similarly, Ragin (2008) argues that fuzzy-set analysis enables researchers to examine the degrees of membership in theoretically meaningful sets and to determine necessity and sufficiency relations. This is why Woodside (2013) argues that we should move beyond symmetric regression when we are likely to have asymmetric causality in the phenomenon.

The use of fsQCA in this study is predicated upon three assumptions that are consistent with the DEI-engagement problem. First, causal conditions may be conjunctural. Diversity may be more important when Inclusion and Psychological Safety are also present. Second, there may be equifinality: there may be several ways to high engagement. Third, there may be causal asymmetry: the causes of high engagement may be more than just the inverse of the causes of low engagement. Pappas and Woodside (2021) provide practical guidelines for applying fsQCA in management-related research, emphasizing calibration, construction of the truth table, necessity analysis, and cautious interpretation of solution terms.

Additionally, recent work supports the use of fsQCA in engagement-related questions. Ye et al. (2024) used fsQCA to investigate configurational routes to employee work engagement in digital transformation contexts. Their study is relevant for the current research as it demonstrates that engagement in technology-intensive contexts can be understood by means of multiple causal

recipes. The Indian IT sector provides a similar conducive context as employees work in project teams, digital transformation pressures, time-bound client delivery and high dependence on collaborative learning.

2.4 Indian IT sector as empirical context

The Indian IT sector is characterized by rapid changes in technology, complex project structures, client-driven deadlines and diverse professional teams. Employees usually work in cross-functional teams, which consist of software developers, mobile application developers, web specialists, database administrators, cybersecurity analysts and project managers. Such work demands technical competence, but also psychological readiness to voice doubts, propose solutions, report errors and challenge assumptions. Psychological Safety thus is not a soft marginal issue; it is a condition for reliable knowledge work.

DEI is also very relevant in this context as Indian IT organizations have employees across gender, age, education, tenure and role categories. Bigger organizations may have formal DEI policies, but smaller and medium-sized firms may rely more on informal managerial practices. Tenure might also influence how employees make sense of the same DEI signals. Long-tenured employees may draw upon a stock of knowledge about organizational practices, while newer employees may need observable fairness and inclusion to feel secure. These contextual differences support the inclusion of tenure and organization size as conditions in the configurational model.

2.5 Proposition development

Propositions are more suitable than standard directional hypotheses in configurational research, as the aim is to identify combinations, not to estimate one mean coefficient. The literature suggests that no one condition should be seen as sufficient in all cases. Diversity, Equity, Inclusion and Psychological Safety are theoretically related, but may each need support from other conditions to create high engagement (Shore et al., 2011; Razzak et al., 2022). So the first proposition is that high Employee Engagement is unlikely to be dependent on one necessary condition only. The literature also points to the fact that Psychological Safety should be very prevalent in high-engagement configurations. Kahn (1990), Edmondson (1999) and Edmondson and Lei (2014) all highlight safety as a condition that encourages interpersonal risk taking and personal investment in work. Equity and Inclusion are also expected to be present. Fairness and belongingness are critical for employees in assessing the employment relationship (Colquitt, 2001; Jansen et al., 2014; Nishii, 2013). Finally, tenure and organizational size are expected to affect pathways as the understanding of DEI might be mediated by the employee experience and by the organizational formalization.

The study puts forth the following propositions. P1: High Employee Engagement is not based on any single prerequisite. P2: Psychological Safety appears as a recurring condition in pathways that generate high Employee Engagement. P3: Equity and inclusion are salient DEI conditions in high engagement configurations. P4: alternative routes to high Employee Engagement depend on tenure



and organization size. P5: The configurational explanation gives insights that cannot be fully described by conventional symmetric models.

Therefore, the literature review leads to clear gap. Existing studies have associated DEI with engagement, inclusion with engagement and psychological safety with voice or performance, but relatively few studies explain how these conditions interact in an Indian IT context. The gap is not only empirical, but also methodological and theoretical. The study doesn't question the importance of DEI. It asks which packages of DEI and safety conditions matter, to whom and in what organizational context. This differentiates the study from a direct-effect, mediation, or demographic-comparison paper.

The configurational approach also fits with the current trend in management research towards causal complexity. Indeed, Fiss (2011) demonstrates how configurations can uncover core and peripheral causal conditions and Woodside (2013) contends that asymmetric thinking can detect patterns that regression might overlook. Pappas and Woodside (2021) also recommend that fsQCA studies should justify calibration thresholds, report results for necessity and sufficiency, and interpret solutions using theoretical logic, and not merely mechanical minimization. The present study follows this logic by using theoretically meaningful anchors, and interpreting each pathway in relation to DEI and Psychological Safety theory.

Another important issue is the difference between presence and experience. Diversity may describe who is in the organization, Inclusion describes whether those employees are engaged in a meaningful way. Equity is the degree to which systems in the organization provide opportunity and recognition fairly. Psychological Safety is the degree to which employees feel they can engage in interpersonal risks of speaking up. It is important to treat these concepts separately as a diverse organization may be inequitable, an equitable organization may still be low in voice, and an inclusive team may not necessarily exist in a large formal organization. This distinction justifies the use of separate fuzzy-set conditions rather than one combined DEI index (Jansen et al., 2014; Shore et al., 2011).

The literature also shows that the meaning of engagement varies across work contexts. Self-expression in role enactment is emphasized by Kahn (1990) and Schaufeli et al. (2002) focus on motivational energy, dedication and absorption. Both views are applicable to IT work. Employees need the motivational intensity to hit the project goals, but they also need psychological permission to raise technical doubts, call for support and disagree with flawed assumptions. Thus, in this paper, Employee Engagement is treated not only as enthusiasm, but as a work-related state supported by fairness, belongingness and interpersonal safety.

Another theoretical rationale for the study is social exchange reasoning. When employees feel they are treated fairly, respected and included, they are more inclined to reciprocate with commitment and engagement. But reciprocity is not necessarily the product of any one factor. Fairness may require a psychologically safe climate; inclusion may require visible organizational support; and

diversity may require equitable systems to avoid being seen as symbolic. Hence, the present study considers DEI conditions as interdependent rather than independent. This viewpoint aligns with empirical evidence showing that diversity management, inclusion and safety impact employee outcomes via diverse mechanisms (Alshaabani et al., 2022; Dongrey & Rokade, 2021; Razzak et al., 2022).

3. Research Methodology

3.1 Research Design

The study applies a quantitative cross-sectional research design and uses fsQCA as the primary analytical tool. The cross-sectional design is suitable as the study is about the current perceptions of employees on diversity, fairness, inclusion, psychological safety and engagement at the workplace. The configurational approach is appropriate because the research question is not about whether a predictor has a linear effect, but rather about whether specific combinations of workplace conditions are sufficient for high Employee Engagement. This approach is in line with the methodological logic of Ragin (2008), Fiss (2011), Woodside (2013), and Pappas and Woodside (2021).

3.2 Sample and Data

The data set was comprised of 360 valid responses from employees working in Indian IT sector. The respondents covered a variety of technical and managerial positions, such as software developers, web developers, mobile application developers, database administrators, cyber security analysts, project/team leads and other IT professionals. The sample was appropriate given that IT work is knowledge-intensive, and relies heavily on collaboration, psychological safety and fair participation. There were no missing values in the data for the variables included in the present analysis.

3.3 Measures

The questionnaire assessed five reflective constructs: Diversity, Equity, Inclusion, Psychological Safety and Employee Engagement. Each construct was measured by five Likert-type items ranging from 1 = strongly disagree to 5 = strongly agree. Diversity items assessed perceived representation, respect for differences, and organizational support for diverse backgrounds. Equity items were associated with fairness of treatment, recognition, reward, access to support and opportunity. Inclusion items captured belongingness, voice, participation, interpersonal acceptance and recognition. Psychological Safety items included comfort in speaking up, seeking help, voicing concerns, and taking interpersonal risks. The Employee Engagement items captured energy, enthusiasm, dedication, pride, involvement and motivation at work. The measurement design aligns with the construct logic established in prior DEI, justice, inclusion, psychological safety and engagement literature (Colquitt, 2001; Edmondson, 1999; Jansen et al., 2014; Schaufeli et al., 2002; Shore et al., 2011).

3.4 Contextual Conditions

Tenure and organization size were included as context covariates. Tenure as employee experience may have an impact on the interpretation of organisational fairness, inclusion and safety. Newer employees might rely more on visible signals and formal onboarding, while seasoned employees may gauge DEI through repeated interactions and accumulated organizational knowledge. Organization size was used, as larger organizations are likely to have more formal DEI systems, structured HR processes and visible grievance or voice mechanisms. However, formalization on its own may not ensure engagement and therefore organization size is a contextual condition rather than a purely demographic one.

3.5 Reliability and Construct Score Creation

Construct level scores were obtained by calculating average item scores for each construct. Internal consistency was examined using Cronbach's alpha. All alpha values were greater than the conventional value of 0.70, indicating acceptable internal consistency. The average alpha for Diversity was 0.867, for Equity was 0.884, for Inclusion was 0.866, for Psychological Safety was 0.863, and for Employee Engagement was 0.868. These results support the use of construct level scores for calibration.

3.6 Calibration Procedure

The calibration of raw values into fuzzy-set membership scores between 0 and 1 is a key step in fsQCA. The five-point scale was calibrated with three anchors: 4.0 for full membership, 3.0 for the crossover point, and 2.0 for full non-membership. These anchors are theoretically meaningful because scores above 4 denote a clear agreement with the presence of a condition, scores close to 3 denote ambiguity and scores close to 2 denote clear non-membership. Tenure was measured as a fuzzy-set indicator of higher tenure and organization size was measured as a fuzzy-set indicator of larger organization size. The outcome, Employee Engagement, was similarly calibrated as membership in the high Employee Engagement set.

3.7 Analytical Procedure

The analysis was carried out in five stages. Descriptive statistics of the respondent profile and construct level were analysed first. Second, we evaluated reliability. Third, raw variables were converted into fuzzy set scores. Fourth, necessity analysis was carried out to check if there is any requirement for high Employee Engagement. The standard criterion of necessity 0.90 was used. Fifth, we applied the truth-table analysis for sufficiency analysis. Configurations were understood based on consistency, coverage and theoretical meaningfulness in line with fsQCA reporting guidance (Pappas & Woodside, 2021; Ragin, 2008).

3.8 Ethical Considerations

Participation was voluntary and the dataset used anonymous responses. No personally identifying information is reported in the paper. Findings are presented only in aggregate form. The study uses employee perceptions for academic analysis and does not identify any organization or individual respondent.

Table 1. Respondent profile

Variable	Distribution
Gender	Male = 199; Female = 136; Prefer not to disclose = 25
Age	Below 25 = 65; 25-34 = 168; 35-44 = 99; 45 and above = 28
Education	Bachelor = 170; Master = 133; Professional/technical = 41; Doctoral/other = 16
Tenure	Less than 1 year = 56; 1-5 years = 140; 6-10 years = 107; Above 10 years = 57
Job role	Software developer = 104; Web developer = 44; Mobile app developer = 50; Project/team lead = 74; Database administrator = 29; Cybersecurity analyst = 39; Other IT role = 20
Organization size	Small = 59; Medium = 131; Large = 170

Table 2. Construct descriptive statistics and reliability

Construct	Mean	SD	Skewness	Kurtosis	Cronbach alpha
Diversity	2.982	1.004	0.038	-0.870	0.867
Equity	2.986	1.012	0.083	-0.776	0.884
Inclusion	2.972	0.996	0.115	-0.681	0.866

Psychological Safety	2.994	0.965	0.102	-0.732	0.863
Employee Engagement	2.995	0.972	0.014	-0.653	0.868

The calibration anchors were selected to make sense with the five-point scale, not to force data into arbitrary percentile groups. A score of 4.0 indicates strong agreement that a condition is present, 3.0 is the crossover point where membership is ambiguous, and 2.0 indicates strong disagreement or non-membership. This direct calibration is preferred for perceptual Likert constructs because it maintains theoretical meaning. It also allows the analysis to remain interpretable for HR managers, who can understand high Equity or high Psychological Safety as a clear perceived agreement, rather than purely a statistical percentile. First, the data set was screened for completeness and construct reliability prior to calibration. The variables used in the analysis had no missing values. The reliability coefficients indicate that the items within each construct measured coherent perceptions. Since fsQCA does not aim at latent variable modelling, the construct means were used as calibrated conditions after establishing reliability. A common approach when survey constructs are theoretically defined and internally consistent. The use of the same respondent-level dataset for fsQCA is methodologically acceptable as the present paper asks a different question than symmetric modelling does. The unit of analysis is the individual employee as a case and the objective is to identify membership to sets such as high Equity, high Inclusion, high Psychological Safety and high Employee Engagement. This case-oriented reading is different from a variable-oriented regression logic. This enables the investigation to determine whether employees with different combinations of set membership have the same high engagement outcome (Ragin, 2008; Pappas & Woodside, 2021).

4. Results and Discussion

4.1 Respondent profile

The dataset contained 360 valid responses from Indian IT employees. The profile suggests that the sample was diverse enough for a configurational analysis of DEI and engagement. There were 199 male respondents, 136 female respondents and 25 respondents who preferred not to disclose gender. The age group 25-34 years was the most dominant with 168 respondents. The sample also contained employees across education, tenure, role and organization size categories. This spread is appropriate since fsQCA treats each respondent as a case and assesses how the conditions combine across cases rather than estimating just one average effect.

4.2 Construct distribution and reliability

The average scores for the constructs were close to the middle of the five-point scale: Diversity = 2.982, Equity = 2.986, Inclusion = 2.972, Psychological Safety = 2.994 and Employee Engagement

= 2.995. The standard deviations were near one, suggesting that sufficient variation for calibration existed. Skewness and kurtosis did not indicate distributional problems. Reliability results were satisfactory with Cronbach's alpha values from 0.863 to 0.884. These results demonstrate that the constructs were internally consistent and had enough variance for fsQCA.

4.3 Necessity Analysis

The initial phase of the fsQCA investigated the necessity of any individual condition for high Employee Engagement. In general, when the consistency is 0.90 or higher the condition is considered necessary. None of the conditions passed this threshold. Organization size was the most consistent followed by Psychological Safety, Equity, Inclusion, Diversity and Tenure. This is in agreement with Proposition 1. One universal necessary condition is not required for High Employee Engagement of Indian IT employees. Rather, it is likely to be produced through combinations of workplace and contextual conditions that are high in engagement. In theory, the absence of a necessary condition matter. This means that even Psychological Safety, while very important, is not enough to explain engagement by itself. Equity and Inclusion, likewise, are important, but not universal conditions in isolation. This finding is consistent with configurational theory which posits that organizational outcomes are often the result of causal recipes rather than single causes (Fiss, 2011; Ragin, 2008). It also explains why linear models may understate complexity: a variable can have a strong average effect and still not be required in each engagement pathway.

4.4 Sufficiency Analysis

Truth-table analysis yielded nine meaningful high-engagement configurations. Each configuration is a sufficient set of conditions associated with high Employee Engagement. The configurations confirm equifinality, in that various different paths lead to the same outcome. Psychological Safety, Equity, Inclusion, and Diversity all appear in six, six, six, and five of the nine pathways, respectively, whereas organization size appears in six pathways and tenure appears in three experienced-employee pathways and three early-tenure pathways in its negated form. This pattern supports Propositions 2, 3 and 4.

Pathway 1: DIV * INC * PSY (consistency = 0.821, coverage = 0.402). This pathway indicates that employees are likely to have high engagement when they perceive the workplace as diverse, inclusive and psychologically safe. The findings support the argument that diversity is relevant for engagement when employees are not only represented but also included and safe to participate. This path is consistent with Shore et al. (2011) and Jerónimo et al. (2022), who argue that inclusion enhances the operational value of diversity practices.

Pathway 2: EQU * ORG * PSY (consistency = 0.840, coverage = 0.450). This is the strongest coverage path. It suggests that the bigger organizations tend to exhibit high engagement when employees experience fair treatment and psychological safety. Larger IT organizations may have

formal HR systems that provide visibility and procedural structure, but employees must feel that those systems are fair and safe. This pathway brings together Colquitt's (2001) justice logic and Edmondson's (1999) psychological safety logic.

Pathway 3: DIV * EQU * INC * ORG (consistency = 0.862, coverage = 0.331). This pathway points to an institutionalized DEI pathway to engagement. In larger organizations, a combination of visible diversity, fairness and inclusion can generate engagement even if Psychological Safety does not show up explicitly in the simplified solution. This is not to deny the importance of safety but rather to suggest that where DEI systems are sufficiently visible and mutually reinforcing, they can constitute a powerful engagement package.

Pathways 4 and 5 are experienced employee pathways. Pathway 4: DIV * EQU * PSY * TEN (consistency = 0.855, coverage = 0.291). Pathway 5: EQU * INC * PSY * TEN (consistency = 0.860, coverage = 0.305). These pathways indicate that fairness and safety are important for higher-tenure employees and can be combined with diversity or inclusion. More experienced employees might have stronger fairness expectations because they have seen organizational systems at work over time. They may also be more sensitive to the extent to which the organization allows for honest participation, dissent and help-seeking.

Pathway 6: INC * ORG * PSY * TEN (consistency = 0.829, coverage = 0.302). This route implies that in larger organisations experienced employees are likely to be highly engaged when inclusion and Psychological Safety are both present. The pathway is theoretically meaningful in that experienced employees in large IT organizations may not need only formal DEI visibility; they may need evidence that their voice still matters. Thus, inclusion and safety are important mechanisms for maintaining engagement across the tenure stages.

Pathways 7, 8 and 9 are early tenure pathways in larger organizations. Pathway 7: DIV * EQU * ORG * ~TEN (consistency = 0.861, coverage = 0.319). Pathway 8: DIV * INC * ORG * ~TEN (consistency = 0.858, coverage = 0.312). Pathway 9: EQU * INC * ORG * ~TEN (consistency = 0.874, coverage = 0.324). The results highlight the potential that employees with shorter tenures may be highly engaged when exposed to visible signals of diversity, fairness and inclusion in larger organizations. Early impressions of fairness and belongingness may be particularly important for newer employees as they set the stage for confidence in the organization.

4.5 Integrated Interpretation

The results reveal that high Employee Engagement is configurational and asymmetric. No single condition is required, but some conditions are repeated across pathways. Psychological Safety is particularly prevalent, appearing in six pathways, which bolsters the argument that employees are more engaged when they can share ideas, ask for help and participate without fear (Edmondson & Lei, 2014; Kahn, 1990). And Equity and Inclusion appear over and over again showing that

fairness and belongingness are central to engagement-building. Diversity is important, but it works best in the context of inclusion, equity or organizational context.

The results also indicate that the effects of tenure and organization size should not be considered as mere background controls. They make up how DEI and Psychological Safety intersect. Many pathways include larger organisations, suggesting that formal systems and scale can be a vehicle for engagement, if combined with fair and inclusive workplace experiences. Tenure distinguishes pathways to engagement: experienced employees want combinations that reinforce safety, fairness and voice, but new employees want to see signals of diversity, fairness and inclusion. This is consistent with the configurational argument that different causal packages can give rise to the same engagement outcome.

4.6 Comparison with symmetric logic

The configuration results add to but are complementary to the logic of traditional regression or PLS-SEM. In a symmetrical model, Equity or Psychological Safety may be found to have the greatest direct impact on Employee Engagement. fsQCA provides a different insight – Equity and Psychological Safety are important, but they are important as elements of alternative bundles. Diversity and Inclusion are decisive in some pathways, whereas Equity and organisation size are decisive in others; and in experienced-employee routes, tenure combines with fairness and safety. This is in line with Proposition 5 and supports Woodside's (2013) argument that asymmetric methods can identify patterns hidden by net-effect models.

4.7 Theoretical implications

The first theoretical implication is that DEI should be understood as a system of interdependent employee experiences. Diversity, Equity and Inclusion are related but different concepts. Diversity gives us the value of representation. Equity gives us fairness. Inclusion gives us voice and belonging. The fsQCA results show that such conditions can combine in different ways to generate engagement. This shifts DEI research from treating DEI as a single composite score to a more nuanced understanding of causal bundles.

The second implication is for Psychological Safety. Results support Psychological Safety as a recurrent condition, but not as a universal necessary condition. This is theoretically useful because it avoids over-emphasizing safety as a single magic variable. Instead, it shows that safety works with fairness, inclusion, diversity and context. This interpretation is also compatible with Edmondson and Lei (2014) who characterize Psychological Safety as being interpersonal and context sensitive rather than individual.

Third implication is with respect to Indian IT sector. IT work engagement isn't just about compensation, workload or technical skill. In complex project environments, employees must feel they can speak up, contribute ideas and get fair treatment. The configurations reveal that Indian IT organizations can build engagement via multiple avenues but almost all avenues require a

meaningful mix of workplace experience conditions. Thus, engagement strategies need to be designed as holistic HR systems and not as stand-alone diversity initiatives.

4.8 Managerial implications

The results give practical guidelines for HR managers and team leaders. Diversity should not, first and foremost, be viewed as a number. Diversity is what drives engagement when employees feel included and safe as well. Second, Equity should be reinforced through transparent systems of appraisal, promotion, reward and development. Third, Psychological Safety must be deliberately constructed through open communication, respectful treatment of dissent, non-punitive discussions of errors, and accessibility of leaders.

Fourth, engagement strategies should be tenure sensitive. New employees may require visible signals of fairness and inclusion during onboarding, project allocation, and early feedback cycles. Experienced employees may need continuous voice, recognition and evidence of fairness beyond initial entry. Fifth, organization size should be used positively. Larger organisations should ensure that formal DEI systems translate into lived employee experience; smaller organisations should develop informal, but credible, mechanisms of fairness, inclusion and safety.

Table 3. Necessity analysis for high Employee Engagement

Condition	Consistency	Coverage
ORG	0.734	0.574
PSY	0.724	0.740
EQU	0.702	0.716
INC	0.661	0.687
DIV	0.654	0.660
~TEN	0.639	0.620
TEN	0.584	0.600
~INC	0.500	0.481
~DIV	0.492	0.486
~EQU	0.466	0.456

~PSY	0.458	0.447
~ORG	0.444	0.614

Table 4. Sufficiency configurations for high Employee Engagement

Pathway	Configuration	Consistency	Coverage	Interpretation
P1	DIV * INC * PSY	0.821	0.402	High diversity, inclusion and psychological safety
P2	EQU * ORG * PSY	0.840	0.450	Equity and psychological safety in larger organizations
P3	DIV * EQU * INC * ORG	0.862	0.331	Institutionalized DEI pathway in larger organizations
P4	DIV * EQU * PSY * TEN	0.855	0.291	Experienced- employee fairness and safety route
P5	EQU * INC * PSY * TEN	0.860	0.305	Experienced- employee fairness, inclusion and safety route
P6	INC * ORG * PSY * TEN	0.829	0.302	Experienced- employee inclusion-safety

				route in larger organizations
P7	DIV * EQU * ORG * ~TEN	0.861	0.319	Early-tenure route supported by diversity and fairness
P8	DIV * INC * ORG * ~TEN	0.858	0.312	Early-tenure diversity-inclusion route in larger organizations
P9	EQU * INC * ORG * ~TEN	0.874	0.324	Early-tenure fairness-inclusion route in larger organizations

Another implication has to do with measurement. DEI success should not just be measured by demographic representation. Representation matters but the findings suggest that engagement is more likely when employees experience fairness, inclusion and safety together. So, HR dashboards should include employee-experience metrics such as perceived fairness, belongingness, voice climate and safety to speak up. Such indicators can help organizations determine whether formal DEI efforts are becoming meaningful workplace experiences. The managerial value of fsQCA results is to segment, not stereotype. The results do not suggest that all new employees or all seasoned employees require the same intervention. Rather, they illustrate how tenure and organization size could be used as contextual lenses when designing engagement interventions. For organizations with large employee bases, it may be beneficial to align formal DEI architecture with safety practices at the team level. Less formal infrastructure in small organizations can be offset by the development of credible informal fairness and voice mechanisms. Either way, engagement requires coherence across conditions. For employees with longer tenure, paths are about maintaining engagement rather than creating initial attachment. Even if seasoned employees know organizational policies and routines, they remain sensitive to whether their contributions are valued, whether they are able to challenge decisions, and whether fairness is maintained over time. The presence of TEN in experienced employee pathways thus implies that engagement must be renewed by continuous fairness, inclusion and safety rather than assumed as a consequence of tenure.

The lower tenure configurations are especially relevant for IT organizations with high mobility of employees. Employees with less experience may not have much historical knowledge of the organization and therefore may rely on visible signals of fairness, diversity and inclusion. If these signals are valid, they can accelerate psychological attachment and work involvement. Conversely, early exposure to bias or exclusion can cause employees to disengage more rapidly. This makes onboarding, initial project allocation, supervisor communication and early feedback critical touchpoints.

Theoretically, the findings suggest that Equity may serve as a structural condition, Inclusion as a relational condition, Diversity as a representational condition, and Psychological Safety as an interpersonal-risk condition. Employee Engagement occurs when these conditions are combined in ways that reduce uncertainty and increase the employee's willingness to exert effort. This interpretation integrates organizational justice theory, inclusion theory, and psychological safety theory into a configurational explanation (Colquitt, 2001; Edmondson & Lei, 2014; Shore et al., 2011).

The overall solution also serves as a helpful lens for understanding DEI maturity in organizations. Pathways that blend Diversity, Equity and Inclusion imply a mature DEI system in which representation, fairness and belongingness reinforce each other. Pathways with Equity and Psychological Safety propose that fairness and safety can engender engagement even where diversity is not the primary condition. Inclusion and Psychological Safety are indicators of a relational pathway where employees are engaged because they feel heard and protected in their interpersonal exchanges. The results thus do not support a one-size-fits-all DEI policy.

5. Conclusion

The study used fsQCA to examine Diversity, Equity, Inclusion, Psychological Safety, tenure and organization size to explore multiple pathways to high Employee Engagement among Indian IT employees. The study was motivated by the limitation of linear approaches that identify average effects but may miss equifinality and causal asymmetry. We calibrated construct-level scores into fuzzy-set memberships using data from 360 IT employees and conducted necessity and sufficiency analyses.

The main conclusion is that High Employee Engagement does not rely on any single necessary condition. All of the six conditions failed to reach the 0.90 necessity threshold. That's why engagement is better understood as the outcome of causal combinations. The sufficiency analysis demonstrated that nine meaningful configurations were identifiable, illustrating that high engagement can be achieved via diversity-inclusion-safety, fairness-safety, institutionalized DEI, experienced-employee and early-tenure pathways. Psychological Safety was a common condition, but not a universal independent prerequisite. Equity and Inclusion also came up repeatedly, implying that fairness and belongingness are key to engagement building. Diversity mattered when coupled with inclusion, equity or organization scale. Tenure and organization size determined the specific paths, revealing the influence of employee context on translating DEI and safety to

engagement.

The study advances theory by conceptualizing DEI as a configurational employee-experience system. It contributes to the Psychological Safety literature by demonstrating that safety is part of several causal recipes. It makes a methodological contribution by applying fsQCA in the context of Indian IT employee engagement, thereby introducing an asymmetric perspective to a literature that has been dominated by regression and SEM approaches. For managers, the findings suggest that engagement strategies should be based on fairness, inclusion, diversity and safety rather than on stand-alone DEI policies. The cross-sectional design does not permit strong causal inference over time. Longitudinal data can be used in future research to explore the evolution of engagement pathways across project cycles or career stages. The study relies on self-reported survey data, which may be subject to common-method concerns. Future research could include supervisor ratings, team-level indicators, or objective retention outcomes. Future research can compare the configurations across sectors, countries or organizational forms as the study is limited to Indian IT employees. Nevertheless, the paper makes a strong contribution by demonstrating that multiple bundles of workplace conditions produce high Employee Engagement, rather than one universal formula.

Declarations

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Ethical approval: The study used anonymous survey responses for academic research. No personally identifiable information is reported.

Data availability: The dataset used for analysis is available from the corresponding author upon reasonable request, subject to confidentiality and ethical restrictions.

References

- Alshaabani, A., Hamza, K. A., & Rudnák, I. (2022). Impact of diversity management on employees' engagement: The role of organizational trust and job insecurity. *Sustainability*, 14(1), 420. <https://doi.org/10.3390/su14010420>
- Colquitt, J. A. (2001). On the dimensionality of organizational justice: A construct validation of a measure. *Journal of Applied Psychology*, 86(3), 386-400. <https://doi.org/10.1037/0021-9010.86.3.386>
- Dongrey, R., & Rokade, V. (2021). Assessing the effect of perceived diversity practices and psychological safety on contextual performance for sustainable workplace. *Sustainability*, 13(21), 11653. <https://doi.org/10.3390/su132111653>
- Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly*, 44(2), 350-383. <https://doi.org/10.2307/2666999>
- Edmondson, A. C., & Lei, Z. (2014). Psychological safety: The history, renaissance, and future of an interpersonal construct. *Annual Review of Organizational Psychology and Organizational Behavior*, 1, 23-43. <https://doi.org/10.1146/annurev-orgpsych-031413-091305>
- Fatoki, O. (2024). Inclusive leadership and employee voice behaviour: Serial mediating roles of psychological safety and affective commitment. *Administrative Sciences*, 14(9), 199. <https://doi.org/10.3390/admsci14090199>
- Fiss, P. C. (2011). Building better causal theories: A fuzzy set approach to typologies in organization research. *Academy of Management Journal*, 54(2), 393-420. <https://doi.org/10.5465/amj.2011.60263120>
- Jansen, W. S., Otten, S., van der Zee, K. I., & Jans, L. (2014). Inclusion: Conceptualization and measurement. *European Journal of Social Psychology*, 44(4), 370-385. <https://doi.org/10.1002/ejsp.2011>
- Jerónimo, H. M., Henriques, P. L., & Carvalho, S. I. (2022). Being inclusive boosts impact of diversity practices on employee engagement. *Management Research: Journal of the Iberoamerican Academy of Management*, 20(2), 129-147. <https://doi.org/10.1108/MRJIAM-05-2021-1175>
- Kahn, W. A. (1990). Psychological conditions of personal engagement and disengagement at work. *Academy of Management Journal*, 33(4), 692-724. <https://doi.org/10.5465/256287>
- Kim, S., Lee, H., & Connerton, T. P. (2020). How psychological safety affects team performance: Mediating role of efficacy and learning behavior. *Frontiers in Psychology*, 11, 1581. <https://doi.org/10.3389/fpsyg.2020.01581>



- Nishii, L. H. (2013). The benefits of climate for inclusion for gender-diverse groups. *Academy of Management Journal*, 56(6), 1754-1774. <https://doi.org/10.5465/amj.2009.0823>
- Pappas, I. O., & Woodside, A. G. (2021). Fuzzy-set qualitative comparative analysis (fsQCA): Guidelines for research practice in information systems and marketing. *International Journal of Information Management*, 58, 102310. <https://doi.org/10.1016/j.ijinfomgt.2021.102310>
- Ragin, C. C. (2008). *Redesigning social inquiry: Fuzzy sets and beyond*. University of Chicago Press.
- Razzak, M. R., Khan, G. M., & AlAbri, S. (2022). Inclusion and employee engagement of nonfamily employees in family firms: Moderating influence of procedural justice. *Journal of Family Business Management*, 12(4), 708-728. <https://doi.org/10.1108/JFBM-11-2020-0103>
- Schaufeli, W. B., Salanova, M., Gonzalez-Roma, V., & Bakker, A. B. (2002). The measurement of engagement and burnout: A two sample confirmatory factor analytic approach. *Journal of Happiness Studies*, 3, 71-92. <https://doi.org/10.1023/A:1015630930326>
- Shore, L. M., Randel, A. E., Chung, B. G., Dean, M. A., Ehrhart, K. H., & Singh, G. (2011). Inclusion and diversity in work groups: A review and model for future research. *Journal of Management*, 37(4), 1262-1289. <https://doi.org/10.1177/0149206310385943>
- Vakira, E., Shereni, N. C., Ncube, C. M., & Ndlovu, N. (2023). The effect of inclusive leadership on employee engagement, mediated by psychological safety in the hospitality industry. *Journal of Hospitality and Tourism Insights*, 6(2), 819-834. <https://doi.org/10.1108/JHTI-09-2021-0261>
- Woodside, A. G. (2013). Moving beyond multiple regression analysis to algorithms: Calling for adoption of a paradigm shift from symmetric to asymmetric thinking in data analysis and crafting theory. *Journal of Business Research*, 66(4), 463-472. <https://doi.org/10.1016/j.jbusres.2012.12.021>
- Ye, D., Xu, B., Wei, B., Zheng, L., & Wu, Y. J. (2024). Employee work engagement in the digital transformation of enterprises: A fuzzy-set qualitative comparative analysis. *Humanities and Social Sciences Communications*, 11, Article 35. <https://doi.org/10.1057/s41599-023-02418-y>